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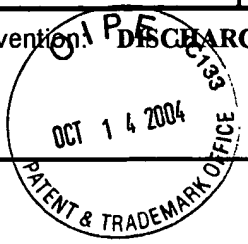
CERTIFICATE OF MAILING BY FIRST CLASS MAIL (37 CFR 1.8) Applicant(s): **Rainer Keifer**			Docket No. **WSP204US**	
Application No. **10/069,636**	Filing Date **August 5, 2002**	Examiner **Stephen M. Hepperle**	Customer No. **24041**	Group Art Unit **3753**

Invention: **DISCHARGE VALVE FOR CO2 PRESSURE CYLINDERS**



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P07A/REV04

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant: Rainer Kiefer

U.S. Patent Application No. 10/069,636

For: DISCHARGE VALVE FOR CO_2 PRESSURE CYLINDERS

Filed: August 5, 2002

Examiner: Stephen M. Hepperle

Group Art Unit: 3753

Confirmation No.: 3353

Customer No.: 24041

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Michael L. Dunn
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SUBSTITUTE APPEAL BRIEF
(37 CFR 1.192)

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Honorable Sir:

Enclosed is a substitute brief showing a correction to the "Real Party in Interest".

Applicants respectfully appeal the decision of the Examiner finally rejecting Claims 20-39 as set forth in his Office Action dated December 24, 2003. A Notice of Appeal was timely mailed to the U.S.P.T.O. with a certificate of mailing on April 26, 2004 and authorization for charging our deposit account for a one month extension of time.

Real Parties in Interest

The real party in interest is Soda-Club (CO_2) Atlantic GmbH, Assignee of the above application by assignment recorded in the Patent and Trademark Office at Reel 013657, Frame 0502.

Related Appeals and Interferences

There are no related appeals or interferences.

Status of Claims

The application originally contained 19 claims. Claims 1-19 have been cancelled. Claims 20-39 have been added by amendment. No claims have been amended. Claims 20-39 pending on Appeal are set forth in the Appendix.

Status of Amendments

No claims have been amended. No amendments have been offered which have not been entered.

Summary of the Invention

The invention is a discharge valve for CO_2 pressure cylinders. The valve has a flow passage (8) for CO_2 gas, a valve element (10) which is actuable from the exterior and which can assume various positions and which in at least one of said positions closes the flow passage and in at least one other of its positions opens the flow passage through a valve opening, and connecting means for fixedly and sealingly connecting the discharge valve to a CO_2 pressure cylinder. At the heart of the invention, a flow resistance is provided in the flow passage (8), which flow resistance is independent of the valve opening and wherein the flow resistance is such that at a temperature of 20°C and a CO_2 gas flow rate of 0.5 g/s it causes a pressure drop of

at least 1 bar to prevent discharge of liquid CO_2, e.g. when the valve is inverted. **Prior to the present invention it was simply not recognized that providing a flow resistance as above described could or would prevent discharge of liquid CO_2 when the valve is inverted.**

Issues Presented for Review

1. Whether claims 20-25 and 34-36 are patentable under 35 USC 103 over U.S. Patent 5,305,794 to George or U.S. Patent 4,611,628 to Pasternack;

2. Whether claims 20-23 and 26-30 are patentable under 35 U.S.C.103(a) over U.S. Patent 4,142,652 to Platt;

3. Whether claims 35 and 39 are patentable over German patent publication DE2406313 to Mays under 35 U.S.C. 103(a)

4. Whether claims 37-39 are patentable under 35 U.S.C. 103(a) over Pasternak; and

5. Whether claims 31-33 are patentable under 35 U.S.C. 103(a) over Pasternak in view of U.S. Patent 3,520,330 to Szwargulski.

Grouping of Claims

The claims do not stand or fall together. The subclaims further restrict the independent claims with patentably significant limitations. For example subclaims having restrictors with even higher pressure drops than 1 bar are even further removed from any suggestion in the prior art and a combination of such a valve with a by-pass check valve to permit filing past the flow restrictor is a patentable distinction in its own right over and above the patentable distinctions already in claim 20. Further structurally significant differences for ease of sealing and assembly provide patentable distinctions in addition to those already in claim 20. Furthermore, the specific

embodiments in the subclaims are specifically not described in the cited art. Additionally, all claims are not subject to the same rejections.

Argument

Claims 20-25 and 34-36 have been rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 5,305,794 to George or U.S. Patent 4,611,628 to Pasternack.

Claims 20-23 and 26-30 have been rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 4,142,652 to Platt.

Claims 35 and 39 have been rejected under 35 U.S.C. 103(a) as being unpatentable over German patent publication DE2406313 to Mays.

Claims 37-39 have been rejected under 35 U.S.C. 103(a) as being unpatentable over Pasternack.

Claims 31-33 have been rejected under 35 U.S.C. 103(a) as being unpatentable over Pasternack in view of Szwargulski.

All claims are restricted to a discharge valve for a CO_2 pressure vessel having a flow resistance, independent of the valve opening, provided in a flow passage through a valve opening where the flow resistance causes a pressure drop of at least 1 bar at a temperature of 20°C and a gas flow rate of 0.5g/s.

The Examiner argues that it would be obvious in view of the cited references to provide a flow resistance in a valve passage independent of the valve opening and that one skilled in the art could design such a flow resistance to provide a pressure drop of 1 bar.

The Examiner misses the point. There are literally trillions of things one skilled in art might do but there must be some motivation to pick from among the trillions of possibilities and do one. Even assuming that it would be obvious to one skilled in the art to provide an independent flow resistance in a flow passage in a CO_2 discharge valve and assuming that one skilled in the art could design such a flow resistance to cause a pressure drop of 1 bar, if there was motivation to do so, **the cited references provide no such motivation**. There is no motivation for providing an independent restrictor in a CO_2 valve. Why would one do so? There is no motivation to design such a restrictor having a pressure drop of 1 bar at a temperature of 20°C and a gas flow rate of 0.5g/s. Even if one were to agree that one skilled in art could do it, why would one do it? There is no motivation provided in the cited references for such an independent flow restrictor in a CO_2 discharge valve providing a 1 bar pressure drop. The claimed invention is simply not suggested by the cited art. There is no reason why one skilled in the art would create the claimed valve structure from among millions of other possible structures similarly having no provided motivation.

The only motivation comes from the Applicants' own specification based upon impermissible hindsight, i.e. to prevent discharge of liquid CO_2, e.g. when the valve is inverted. **The cited references disclose nothing that could be remotely construed as structure for that purpose**.

The Examiner has rejected Claims 20-25 and 34-36 under 35 U.S.C. 103 as being unpatentable over U.S. Patent 5,305,794 to George or U.S. Patent 4,611,628 to Pasternack. **This rejection should be reversed**.

The common purpose for restriction paths is to provide pressure attenuation within the valve itself in order to extract gas, held at a high pressure within a vessel, at a low pressure. The discharge valve itself thus provides most of the attenuation. This leads to the serious problem that if liquid gas enters the valve, e.g. by inversion of the container, liquid gas reaches the low pressure side of the valve which is not designed to withstand the resulting high pressure and further, liquid gas can pass through the valve in liquid form. It has now been discovered that if a flow resistance is provided before and independently of the valve opening, of at least 1 bar under the conditions set out in the pending claims, the resulting high pressure drop prevents liquid gas from entering the low pressure side of the valve.

According to the Examiner, "George shows a pressure cylinder with an external valve 6 and a fill valve 27 that has an always open restriction path 18, 22 for outflow of fluid." The George patent is directed to a valve assembly that provides for fast filling and slower discharge. A large pressure drop to the outlet valve is not needed for that purpose. There is no way that George discloses or suggests a restriction path providing a pressure drop of at least 1 bar independently of the valve opening under the conditions of the present claims. Further there is no disclosure or suggestion as to why one would wish to design such a restriction path having such a high pressure drop. The Examiner's statement that it "would have been obvious" is entirely unsupported by the Examiner. Why would one wish to make such a design? The only reason for doing so must be obtained from the teachings of the present application using impermissible hindsight. One skilled in the art can design almost anything but unless the existing art provides some reasonable purpose for doing so, such design would be mere wasted

energy from amongst trillions of other possible designs having no reasonable purpose. Such a state of the art simply does not render a purposeful design obvious to one skilled in the art.

The Pasternack reference similarly gives no "reason" for designing a restriction path so as to provide a pressure drop as high as 1 bar and is subject to exactly the same defects as George. Pasternack is concerned with evening out pressure fluctuations in using gas to operate equipment, not a continuous pressure drop to prevent the flow high pressure liquid gas in situations where liquid gas can reach the outlet from the high pressure source. Pasternack is thus non-analogous art combined in hindsight and the combination still does not suggest the present invention. **The rejection should be reversed.**

The Examiner has also rejected claims 20-23 and 26-30 under 35 U.S.C. 103 as being unpatentable over U.S. Patent 4,142,652 to Platt. **This rejection should also be reversed.** There is absolutely nothing in Platt suggesting a restriction path providing a pressure drop of at least 1 bar independently of the valve opening. The mere fact that a sintered flow resistance is provided does not suggest that there is a pressure drop of at least 1 bar to prevent liquid from entering the low pressure side of the valve and in fact Platt specifically says that liquid passes through the valve and thus cannot possibly provide the required pressure drop of the present invention nor suggest such a structure. Platt thus teaches away from the present invention. **The rejection should be reversed.**

The Examiner has also rejected claims 35 and 39 over German patent publication DE2406313 to Mays. There is simply no suggestion in this reference with respect to a pressure

drop of at least 1 bar in a flow passage independently of the valve opening as required by the present claims. **The rejection should be reversed.**

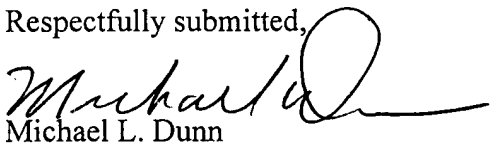
Claims 37-39 have been rejected under 35 U.S.C. 103 as being unpatentable over Pasternack. Claims 37-39 are ultimately dependent upon Claim 35 and are patentable over the Pasternack patent for the reasons previously given. The rejection should therefore also be **reversed.**

Claims 31-33 have been rejected under 35 U.S.C. 103 as being unpatentable over Pasternack in view of Szwargulski. Szwargulski does not cure the critical defects of the Pasternack patent previously discussed. Pasternack does not disclose or suggest structure for creating a pressure drop of at least 1 bar independently of the valve opening and neither does Szwargulski. Further neither reference nor their combination suggest any reason for doing so. The rejection should be **reversed.**

Conclusion

In view of the foregoing, it is clear that the pending claims are patentable over the cited prior art. Reversal of the Examiner and allowance of all claims are therefore respectfully requested.

Respectfully submitted,



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MLD/mjk

Appendix

Reprinted below are the claims on appeal:

20. A discharge valve for CO_2 pressure cylinders, comprising a flow passage (8) for CO_2 gas, a valve element (10) which is actuable from the exterior and which can assume various positions and which in at least one of said positions closes the flow passage and in at least one other of its positions opens the flow passage through a valve opening, and connecting means for fixedly and sealingly connecting the discharge valve to a CO_2 pressure cylinder, wherein a flow resistance is provided in the flow passage (8), which flow resistance is independent of the valve opening and wherein the flow resistance is such that at a temperature of 20°C and a CO_2 gas flow rate of 0.5 g/s it causes a pressure drop of at least 1 bar.

21. A discharge valve as set forth in Claim 20 wherein the pressure drop is more than 5 bars.

22. A discharge valve as set forth in Claim 21 wherein the pressure drop is a maximum of 50 bars.

23. A discharge valve as set forth in Claim 22 wherein the pressure drop is between 10 and 30 bars.

24. A discharge valve as set forth in Claim 20 wherein a check valve is provided that is independent of the discharge valve, said check valve, in an intake direction to fill a cylinder, opening a by-pass, by-passing the flow resistance and closing the by-pass in a discharge flow direction out of the cylinder.

25. A discharge valve as set forth in Claim 24 wherein the check valve is resiliently biased in a closed position.

26. A discharge valve as set forth in Claim 20 wherein the flow resistance is a sintered body or a pressure-resistant diaphragm.

27. A discharge valve as set forth in Claim 26 wherein the flow resistance at least partially comprises plastic material, ceramic or metal.

28. A discharge valve as set forth in Claim 26 in which the flow resistance comprises a sintered body having an average pore size in the range of between 1 and 10 μm.

29. A discharge valve as set forth in Claim 28 wherein the sintered body has a porosity of between 10 and 80%.

30. A discharge valve as set forth in Claim 28 wherein the sintered body has a porosity of between 10 and 40%.

31. A discharge valve as set forth in Claim 26 wherein the flow resistance is in the form of a valve body movably accommodated in a valve seat.

32. A discharge valve as set forth in Claim 31 wherein the flow resistance is biased in the CO_2 discharge flow direction.

33. A discharge valve as set forth in Claim 31 wherein the flow resistance has a substantially tapered surface for reception in the valve seat.

34. A discharge valve as set forth in Claim 20 wherein the valve element (10) is arranged on a side of the discharge valve which is remote from the CO_2 pressure cylinder, and wherein the flow resistance is arranged on a side of the discharge valve, which is towards the CO_2 pressure cylinder.

35. An attachment portion for attachment to a discharge valve for CO_2 pressure cylinders, wherein the attachment portion can be fixedly and sealingly connected to the discharge valve and has a flow resistance therein for causing a pressure drop of at least 1 bar from the pressure cylinder independently of the discharge valve.

36. The attachment portion of Claim 35 wherein the pressure drop is from 5 to 50 bars.

37. An attachment portion for a discharge valve as set forth in Claim 36 wherein the attachment portion has a male screwthread which corresponds to a female screwthread at an end of the discharge valve towards the CO_2 pressure cylinder.

38. An attachment portion as set forth in Claim 36 wherein a maximum outside diameter of the attachment portion is smaller than an inside diameter of a screwthread of the pressure cylinder.

39. An attachment portion as set forth in Claim 35 wherein on a side remote from the discharge valve the attachment portion has a female screwthread whose diameter and pitch correspond to a female screwthread at an end of the discharge valve body remote from the discharge valve.